

Characterization of Open Burning Emissions

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The Agency has recognized open and uncontrolled burning of waste and biomass as a significant but poorly characterized source of air toxics. The objective of recent work has been to quantify emission factors of chlorinated dioxins/furans, polycyclic aromatic hydrocarbons (PAHs), fine particulate matter (PM_{2.5}), various organic biomass smoke tracers, volatile and semi-volatile organic carbons (VOCs and SVOCs), and hexachlorobenzene (HCB) for the suspected largest sources of open/uncontrolled burns. Efforts over the last five years have documented emissions from woodstoves; barrel burns of domestic waste; and pressure-treated lumber fires, forest fires, and prairie fires as well as various agricultural practice fires such as sugar cane, wheat, rice, and grass stubble. Emissions have been characterized by a combination of field sampling and laboratory-based simulations. The ORD/NRMRL's work has been conducted in partnerships with the University of Sydney (Australia), the Australian National Research Centre for Environmental Toxicology, Washington State University, the U.S. Environmental Protection Agency (U.S. EPA) Regions 4 and 10, the U.S. EPA/Office of Pollution Prevention and Toxics, the U.S. Department of Defense, the U.S. Fish and Wildlife Service (Department of the Interior), and the U.S. Department of Agriculture's Forest Service.

This work has impacted the national inventories of persistent organic pollutants (POPs) mandated by the Stockholm Convention in that these heretofore uncharacterized sources have become recognized as major sources of (for example) chlorinated dioxin and furan contamination. Preliminary indications suggest that these sources can equal or exceed the magnitude of dioxins for industrial sources. Remediation of dioxins from these sources can include policy implementation/enforcement (e.g., barrel burn bans) and practice changes (e.g., agricultural field burn bans or increased pre-fire fuel utilization). These efforts will also put these uncontrolled sources in perspective with industrial sources and lead to an understanding of how much industrial source regulation will or can affect risk.